

OEDG Track 1: Expanding Geoscience Diversity through Simulated Field Environments for Students with Physical Disabilities

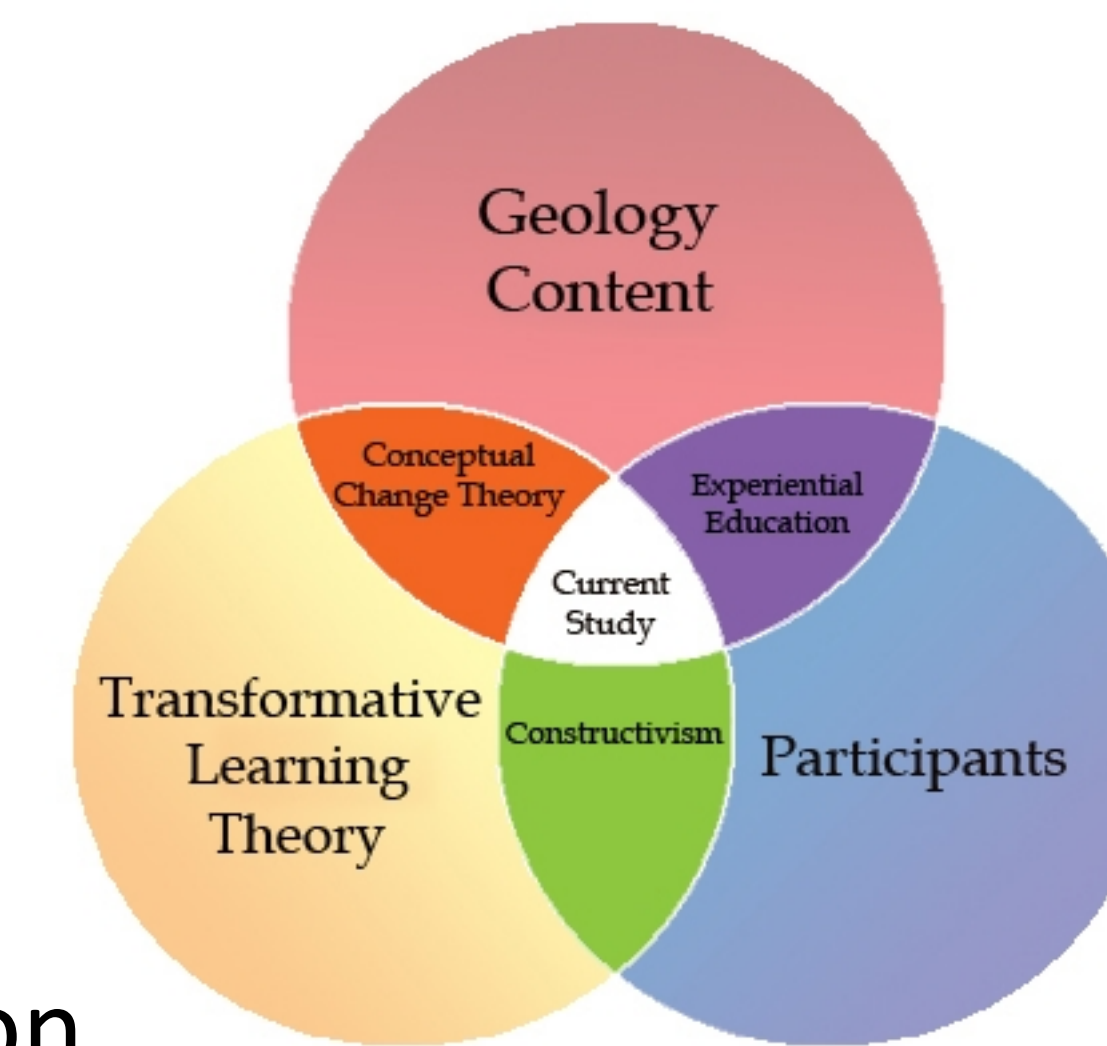
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Problem Statements

- Importance of field experience in the geoscience curriculum.
- Students with mobility impairments face multiple barriers in field education.
- Challenges of providing accommodations for students who are mobility impaired.
- Limited public understanding of common cave knowledge.

OEDG Planning Grant Findings

1. Identification of misconceptions and increased content knowledge
2. Benefit of experiential education: Construction of knowledge through active engagement
3. Identification of personal, environmental and societal barriers
4. Development of community and appreciation of inclusion



Synthetic view of Mammoth Cave reconstructed from LIDAR data. Image created using Unity game development tool.



Background Information

An assumption exists that most traditional field environments are inaccessible to students with mobility impairments. A main objective of this study was to determine how experience in a geologic field environment assists in the overall construction of cave geology content knowledge for students with mobility impairments.

Also assuming that knowledge is independent of one's physical ability, this study focused on understanding the potential barriers that students with mobility impairments maintain with respect to field-based education.

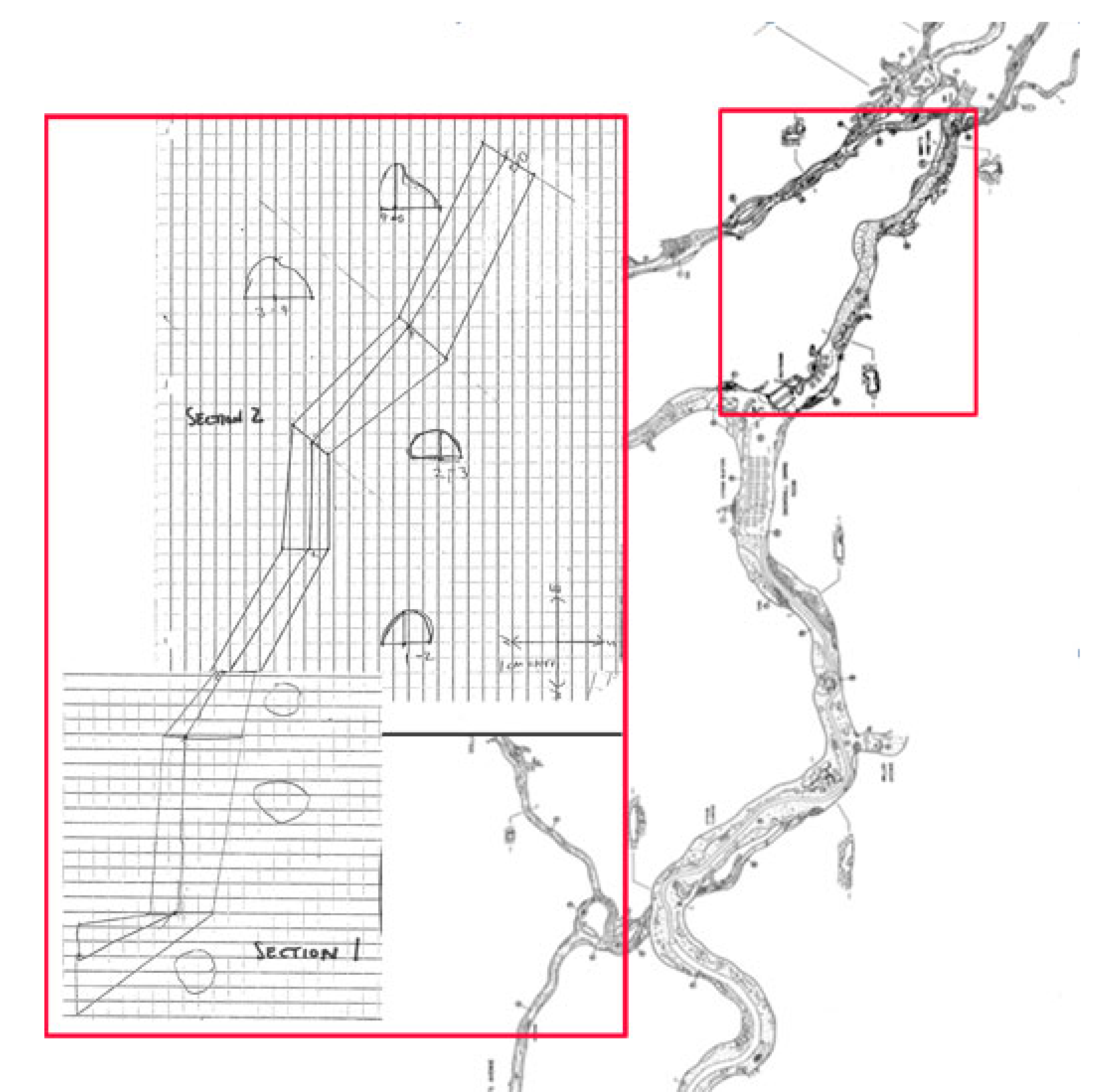
This exploration was not intended to differentiate them from the rest of society by what they do or do not know, what they can or cannot do, but to assist them in obtaining the accessibility and content knowledge of a geoscience field course.

Objectives of OEDG Track 1

1. Obtain structural data of appropriate geological formations for use in the study
2. Integrate the data into a virtual environment to emulate a typical field experience
3. Conduct usability studies with student populations that include participants with mobility impairments
4. Assess the efficacy of the virtual environment to provide an effective educational alternative to field experience
5. Plan for a broader quantified study of the system in a OEDG Track 2 submission.

The expected outcome of this Track 1 proposal is the creation of an interactive virtual representation of a cave and karst system module that can be utilized in various educational settings and also expanded to include more varied geological systems.

Cave Survey				Left	Right	Celling	Door
Station	Distance	Ascent	Vertical Angle				
143.2	15.2	0.0	15	24	9	2	
24.0	15.2	0.0	15	16.34	16.37	14.99	3.55
24.0	15.2	0.0	15	7	24	9	3.4
24.0	15.2	0.0	15	7.09	15.09	15.12	3.8
37	15.2	0.0	15				



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